

Atty. Docket No. OPP031047US
Serial No: 10/751,172

Amendments to the Claims

Please cancel Claims 8, 15, and 16, add new Claims 17-23, and amend the remaining Claims as shown below. This listing of Claims replaces all prior versions and listings of the Claims in this application.

Listing of Claims

1. (Currently amended) A method of manufacturing silicide, comprising the steps of:
 - (a) cleaning a semiconductor substrate with a transistor formed thereon, the transistor including a source electrode, a drain electrode and a gate electrode;
 - (b) placing the cleaned semiconductor substrate into a sputter chamber in a deposition equipment, and initially forming silicide at the same time of depositing a metal film under a state where the semiconductor substrate is heated at a temperature of from greater than 450 [(-)] to 600°C;
 - (c) removing residual metal film not used for the formation of silicide; and
 - (d) annealing the semiconductor substrate.
2. (Currently amended) The method of claim 1, wherein, in the step (b), the silicide with a composition ratio of comprises CoSi is formed.
3. (Currently amended) The method of claim 2, wherein the step (a) includes a first cleaning step of comprising cleaning the semiconductor substrate using with SC1 solution.
4. (Currently amended) The method of claim 3, wherein the step (a) further includes a second cleaning step of comprising cleaning the semiconductor substrate using with HF or DHF (dilute HF) solution.

Atty. Docket No. OPP031047US
Serial No: 10/751,172

5. (Currently amended) The method of claim 1, wherein the step (a) further includes a ~~third cleaning step of~~ plasma cleaning ~~[[(-)]~~ etching the semiconductor substrate in the sputter chamber.

6. (Currently amended) The method of claim 5, wherein the ~~third~~ cleaning step includes a first etching step using at an RF power of 60 - 90W and a second etching step of at an RF power of 250 - 350W.

7. (Currently amended) The method of claim 5, wherein ~~the third cleaning step uses~~ said plasma comprises argon gas of ~~[[8 - 15]]~~ 3 - 8 sccm.

8. (Cancelled)

9. (Currently amended) The method of claim ~~[[8]]~~ 1, wherein, ~~in the step (b)[(,)]~~ comprises sputtering the metal film is formed by using a cobalt sputter with at a DC power of 2 - 10kW.

10. (Currently amended) The method of claim ~~[[8]]~~ 1, wherein, ~~in the step (b)[(,)]~~ comprises sputtering the metal film using argon gas of 40 - 70 sccm ~~is used as gas for a sputtering process, and argon gas of 8 - 15 sccm is used as gas for~~ heating the semiconductor substrate using argon gas of 8 - 15 sccm.

11. (Currently amended) The method of claim 2, wherein the step (c) includes a first removal step of comprising removing the metal film during for 5 - 15 minutes in SPM solution at a temperature of 50 - 150°C and a second removal step of comprising removing the metal film during for 3 - 10 minutes in SC1 solution at a temperature of 40 - 70°C.

Atty. Docket No. OPP031047US
Serial No: 10/751,172

12. (Currently amended) The method of claim 2, wherein the step (d) includes heating the semiconductor substrate during for 10 – 60 seconds at a temperature of 700 - 950°C in a RTP equipment.

13. (Currently amended) The method of claim 2, wherein the step (d) includes heating the semiconductor substrate during for 20 – 60 minutes at a temperature of 500 - 900°C in an electric furnace.

14. (Currently amended) The method of claim 2, wherein, ~~the silicide annealed in~~ after the step (d) the silicide comprises a composition of CoSi_2 .

15-16. (Cancelled)

17. (New) A method of manufacturing silicide, comprising the steps of:

(a) cleaning a semiconductor substrate with a transistor thereon, the transistor including a source electrode, a drain electrode and a gate electrode;

(b) placing the cleaned semiconductor substrate into a sputter chamber and sputtering a metal film at a DC power of 2 – 10kW, while heating the semiconductor substrate at a temperature of 450 to 600°C to form silicide;

(c) removing residual metal film; and

(d) annealing the semiconductor substrate.

18. (New) The method of claim 17, wherein the silicide comprises CoSi .

19. (New) The method of claim 17, wherein step (b) comprises sputtering the metal film using argon gas of 40 – 70 sccm, and heating the semiconductor substrate using argon gas of 8 – 15 sccm.

Atty. Docket No. OPP031047US
Serial No: 10/751,172

20. (New) The method of claim 17, wherein the step (c) includes a first removal step comprising removing the metal film for 5 – 15 minutes in SPM solution at a temperature of 50 - 150°C and a second removal step comprising removing the metal film for 3 – 10 minutes in SC1 solution at a temperature of 40 - 70°C.

21. (New) The method of claim 18, wherein the step (d) includes rapid thermal processing the semiconductor substrate for 10 – 60 seconds at a temperature of 700 - 950°C.

22. (New) The method of claim 18, wherein the step (d) includes heating the semiconductor substrate for 20 – 60 minutes at a temperature of 500 - 900°C in an electric furnace.

23. (New) The method of claim 18, wherein after the step (d) the silicide comprises CoSi_2 .